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CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

REPORT

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SUBJECT Germanium Transistor Development at VEB Werk fuer Fernmeldewesen (OSW) Berlin-Oberschoeneweide

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SUPPLEMENT REPORT NO.

[redacted] THIS IS UNEVALUATED INFORMATION

1. Pos[redacted]-contact [redacted] transistor development was started [redacted] 25X1
upon Soviet prgrs. by the VEB Werk fuer Fernmeldewesen (formerly OSW)
in Berlin-Oberschoeneweide under the supervision of Dr. Bingel (fnu).
This work continued without success for another long period and Dr.
Bingel was finally relieved of this functions. During the last two
years (1953/1954) the development has been headed successively by Dr.
Kurt Richter and Dr. Walter Rohde, a returnee from the Soviet Union. 25X1
The latter is now responsible for the scientific supervision
of OSW germanium transistor developments. He is assisted by Dipl. Phys.
Boell (fnu) who is in charge of germanium technology, in particular
germanium purification. In late 1953, Dr. Rohde submitted a final 25X1
report (Abschlussbericht) on the development to the Central Office for
Research and Technology (Zentralamt fuer Forschung und Technik-ZAFT) of
the State Planning Commission in which the successful termination of the
development was reported, and requests for a new order bearing on the
production of the devices were made. This report, however, was remature
and contained many errors as was found out later when the report was made
available to the Work Circle for Semi-Conductors (Arbeitskreis Halbleiter).
A few samples of model transistors which were completed by the OSW team 25X1
when the report was forwarded to ZAFT turned out to be faulty. The
germanium monocrystals used were not sufficiently pure and had not even
been provided with defined impurities. The OSW enterprises did not ob-
tain the expected production order but continued the development of ger-
manium transistors. The mentioned termination report to ZAFT was changed
and corrected several times during the period from January through August
1954. By August 1954, a few new sample models, which were alleged
to be improved versions of the first ones, were completed. However,
these models still were unusable. The OSW development team has since
carried on the development and the firm still hopes to obtain
a production order from the government, in spite of the fact that in the
meantime the VEB Werk fuer Bauelemente der Nachrichtentechnik, Carl von
Ossietzky (formerly Dralowid) in Teltow, had successfully completed
germanium transistor development, although work at this plant had started
much later than the OSW development. The OSW firm hopes to reverse a
preliminary decision by the State Planning Commission to the effect that
transistor production should be exclusively entrusted to Dralowid.

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This move is based on the fact that the management of OSW has better political relations with the government than that of Dralowid.

2 Boell (Inv) has used the Bridgeman method for the purification of the OSW germanium. Before being subjected to purification by this method the germanium was purified chemically. It was first transformed into germanium tetrachloride, which was chemically purified through fractionated distillation and subsequent hydrolyzation. The resulting germanium dioxide was then reduced with the aid of hydrogen to pure germanium. For Bridgeman purification, the germanium was put into a graphite container 400 millimeters long, with an internal diameter of 3 mm. This container was inserted into an evacuated quartz tube inside of which the pressure was ten power minus 3 (10^{-3}) torr. The tube with the graphite container in it was brought into a melting oven with inductive heating and, after melting of the germanium, was drawn out of the oven at a speed of 400 mm per hour. The maximum purity of the germanium monocrystals thus obtained was 12 ohm centimeters. Most of the monocrystals, however, had purity degrees of 2 and 4 ohm centimeters only. In view of this low purity degree, the development team was forced to make transistor samples directly from these monocrystals and did not even attack the problem of providing pure germanium monocrystals with defined impurities. After August 1.54, the OSW development team started to build an installation for production of pure germanium crystals by the zone melting procedure (Zonenschmelzverfahren)[2]. No conclusive results have been obtained so far.

3 It is estimated that the OSW firm has spent an amount of 600,000 to 700,000 DME for the transistor development since it started in 1950, including funds provided by the Soviets.

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